

REMARKS

The Office Action mailed January 22, 2007 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-25 are now pending in this application. Claims 1-8, 10-18, and 20-25 stand rejected. Claims 9 and 19 stand objected to. Claims 1, 4, 5, 6, 19, 14, 15, 16, 20, 21, 24, and 25 are amended. No new matter has been added.

The rejection of Claims 4, 14, and 24 under 35 U.S.C. § 112 is respectfully traversed. Claims 4, 14, and 24 have been amended to further clarify the region in which a smoothing operation is limited to. For the reasons set forth above, Applicant respectfully requests that the Section 112 rejections of Claims 4, 14, and 24 be withdrawn.

The rejection of Claims 1-4, 10-14, and 20-24 under 35 U.S.C. § 102(b) as being anticipated by Kato et al. (U.S. Patent 4,317,179) ("Kato") is respectfully traversed.

Kato describes an image processing system employing an image processing method. The method includes obtaining an unsharp mask density (Dus) corresponding to a super-low frequency, and performing a signal conversion utilizing an original image density (Dorg) of an original radiographed image and an emphasis coefficient (β) to emphasize a frequency component that is above the super-low frequency (column 2, line 54 – column 3, line 2). The emphasis coefficient (β) may be fixed or changed as a function of the original image density (Dorg) or the unsharp mask density (Dus) (column 3, line 64 – column 4, line 2). Further, by selecting the emphasis coefficient (β) and the unsharp mask density (Dus), a ratio of a maximum value (B) to a minimum value (A) of a modulation transfer function can be changed (column 4, lines 3-13). Notably, Kato does not describe or suggest that the emphasis coefficient (β) is a function of a relative pixel value which is calculated based on a threshold value.

Claim 1 recites a method for filtering images including "obtaining an image; and obtaining a final pixel value by performing a filtering operation on an initial pixel value of at

least one pixel of the image and by modulating the filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value T .”

Kato does not describe nor suggest a method for filtering images as recited in Claim 1. More specifically, Kato does not describe nor suggest modulating a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Kato.

Claims 2-4 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2-4 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 2-4 likewise are patentable over Kato.

Claim 10 recites a method for filtering images including “obtaining a computed tomography (CT) image; and obtaining a final pixel value by performing a filtering operation on an initial pixel value of at least one pixel of the CT image and by modulating the filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value T .”

Kato does not describe nor suggest a method for filtering images as recited in Claim 10. More specifically, Kato does not describe nor suggest modulating a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function. Accordingly, for at least the reasons set forth above, Claim 10 is submitted to be patentable over Kato.

Claim 11 recites a computer-readable medium encoded with a program configured to “obtain an image; and obtain a final pixel value by performing a filtering operation on an initial pixel value of at least one pixel of the image and by modulating the filtering operation

with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value T .”

Kato does not describe nor suggest a computer-readable medium encoded with a program as recited in Claim 11. More specifically, Kato does not describe nor suggest a program configured to modulate a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Kato.

Claims 12-14 depend, directly or indirectly, from independent Claim 11. When the recitations of Claims 12-14 are considered in combination with the recitations of Claim 11, Applicant submits that dependent Claims 12-14 likewise are patentable over Kato.

Claim 20 recites a computer configured to “obtain an image; and obtain a final pixel value by performing a filtering operation on an initial pixel value of at least one pixel of the image and by modulating the filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value T .”

Kato does not describe nor suggest a computer as recited in Claim 20. More specifically, Kato does not describe nor suggest a computer configured to modulate a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function. Accordingly, for at least the reasons set forth above, Claim 20 is submitted to be patentable over Kato.

Claim 21 recites a computed tomographic (CT) imaging system for filtering CT images. The imaging system includes “a detector array . . . and a processor operationally coupled to the detector array, the processor configured to: obtain an image; and obtain a final

pixel value by performing a filtering operation on an initial pixel value of at least one pixel of the image and by modulating the filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value T .”

Kato does not describe nor suggest a computed tomographic (CT) imaging system as recited in Claim 21. More specifically, Kato does not describe nor suggest a computed tomographic (CT) imaging system including a processor configured to modulate a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function. Accordingly, for at least the reasons set forth above, Claim 21 is submitted to be patentable over Kato.

Claims 22-24 depend, directly or indirectly, from independent Claim 21. When the recitations of Claims 22-24 are considered in combination with the recitations of Claim 21, Applicant submits that dependent Claims 22-24 likewise are patentable over Kato.

For at least the reasons set forth above, Applicant respectfully requests that the Section 102 rejection of Claims 1-4, 10-14, and 20-24 be withdrawn.

The rejection of Claims 5, 6, 15, 16, and 25 under 35 U.S.C. § 103 as being unpatentable over Kato in view of Ahmed et al. (U.S. Patent 7,079,686) (“Ahmed”) is respectfully traversed.

Kato is described above.

Ahmed describes systems and methods for enhancing images including a background removal process that compares an intensity value to an intensity threshold (column 9, lines 39-55). The intensity threshold can be manually specified by a user, configured by default, or dynamically calculated (column 9, lines 56-59). Notably, Ahmed does not describe or suggest modulating a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value.

Applicant respectfully submits that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Kato nor Ahmed, considered alone or in combination, describe or suggest the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicant respectfully submits that it would not be obvious to one skilled in the art to combine Kato and Ahmed, because there is no motivation to combine the references suggested in the art. Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicant's own teaching.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicant's disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected in an attempt to arrive at the claimed invention. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of

course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

Claim 1 is recited above. Neither Kato nor Ahmed, considered alone or in combination, describe or suggest a method for filtering images as recited in Claim 1. More specifically, neither Kato nor Ahmed, considered alone or in combination, describe nor suggest modulating a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function, and Ahmed describes a background removal process that determines an intensity threshold. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Kato in view of Ahmed.

Claims 5 and 6 depend indirectly from independent Claim 1. When the recitations of Claims 5 and 6 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 5 and 6 likewise are patentable over Kato in view of Ahmed.

Claim 11 is recited above. Neither Kato nor Ahmed, considered alone or in combination, describe nor suggest a computer-readable medium encoded with a program as recited in Claim 11. More specifically, neither Kato nor Ahmed, considered alone or in combination, describe nor suggest a program configured to modulate a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function, and Ahmed describes a background removal process that determines an intensity threshold. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Kato in view of Ahmed.

Claims 15 and 16 depend indirectly from independent Claim 11. When the recitations of Claims 15 and 16 are considered in combination with the recitations of Claim 11,

Applicant submits that dependent Claims 15 and 16 likewise are patentable over Kato in view of Ahmed.

Claim 21 is recited above. Neither Kato nor Ahmed, considered alone or in combination, describe nor suggest a computed tomographic (CT) imaging system as recited in Claim 21. More specifically, neither Kato nor Ahmed, considered alone or in combination, describe nor suggest a computed tomographic (CT) imaging system including a processor configured to modulate a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function, and Ahmed describes a background removal process that determines an intensity threshold. Accordingly, for at least the reasons set forth above, Claim 21 is submitted to be patentable over Kato in view of Ahmed.

Claim 25 depends indirectly from independent Claim 21. When the recitations of Claim 25 are considered in combination with the recitations of Claim 21, Applicant submits that dependent Claim 25 likewise is patentable over Kato in view of Ahmed.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 5, 6, 15, 16, and 25 be withdrawn.

The rejection of Claims 7, 8, 17, and 18 under 35 U.S.C. § 103 as being unpatentable over Kato in view of Ahmed, and further in view of Nakamura (U.S. Patent 5,649,031) ("Nakamura") is respectfully traversed.

Kato and Ahmed are described above.

Nakamura describes a method for filtering including calculating mean densities ($A(b)$, $A(d)$, $A(h)$, $A(l)$, and $A(n)$) of specified pixels (b , d , h , l , and n) in respective pixel regions, and calculating an edge enhancement value ($E(b)$, $E(d)$, $E(h)$, $E(l)$, and $E(n)$) with respect to each respective pixel (b , d , h , l , and n) (column 3, line 64 – column 4, line 20). Results of each calculation are used as coefficients of a dot filter (column 4, lines 22-25). Notably, the

filtering method does not include modulating a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value.

Applicant respectfully submits that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. None of Kato, Ahmed, and Nakamura, considered alone or in combination, describe or suggest the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicant respectfully submits that it would not be obvious to one skilled in the art to combine Kato with either Ahmed or Nakamura, because there is no motivation to combine the references suggested in the art. Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicant's own teaching.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicant's disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected in an attempt to arrive at the claimed invention. Since there is no teaching nor suggestion in the cited art for the combination, the

Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

Claim 1 is recited above. None of Kato, Ahmed, and Nakamura, considered alone or in combination, describe or suggest a method for filtering images as recited in Claim 1. More specifically, none of Kato, Ahmed, and Nakamura, considered alone or in combination, describe nor suggest modulating a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function, Ahmed describes a background removal process that determines an intensity threshold, and Nakamura describes a filtering method that includes a process for obtaining coefficients for a dot filter. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Kato in view of Ahmed, and further in view of Nakamura.

Claims 7 and 8 depend indirectly from independent Claim 1. When the recitations of Claims 7 and 8 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 7 and 8 likewise are patentable over Kato in view of Ahmed, and further in view of Nakamura.

Claim 11 is recited above. None of Kato, Ahmed, and Nakamura, considered alone or in combination, describe nor suggest a computer-readable medium encoded with a program as recited in Claim 11. More specifically, none of Kato, Ahmed, and Nakamura, considered alone or in combination, describe nor suggest a program configured to modulate a filtering operation with a gain factor that is a function of a relative pixel value which is calculated based on a threshold value. Rather, in contrast to the present invention, Kato describes a processing method that includes changing an emphasis coefficient (β) to change a maximum to minimum ratio of a modulation transfer function, Ahmed describes a background removal process that determines an intensity threshold, and Nakamura describes a filtering method that includes a process for obtaining coefficients for a dot filter. Accordingly, for at least the

reasons set forth above, Claim 11 is submitted to be patentable over Kato in view of Ahmed, and further in view of Nakamura.

Claims 17 and 18 depend indirectly from independent Claim 11. When the recitations of Claims 17 and 18 are considered in combination with the recitations of Claim 11, Applicant submits that dependent Claims 17 and 18 likewise are patentable over Kato in view of Ahmed, and further in view of Nakamura.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 7, 8, 17, and 18 be withdrawn.

Claims 9 and 19 were indicated as being allowable if “rewritten in independent form including all limitations of the base claim and any intervening claims.”

Claims 9 depends indirectly from independent Claim 1 which is submitted to be in condition for allowance. When the recitations of Claim 9 are considered in combination with the recitation of Claim 1, Applicant submits that dependent Claim 9 likewise is in condition for allowance.

Claims 19 depends indirectly from independent Claim 11 which is submitted to be in condition for allowance. When the recitations of Claim 19 are considered in combination with the recitation of Claim 11, Applicant submits that dependent Claim 19 likewise is in condition for allowance.

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In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,



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